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coast. The prevalence of poliomyelitis in these States is distinctly and markedly above that of the rest of the country.

The relation between these groups of States is at the present time largely conjectural. It is conceivable, however, that they may represent three distinct foci of prevalence which have joined. There are some data which might support such a view to a limited extent. We might reasonably conceive that one focus, starting in New York City and vicinity, has stretched north through New England, west along the Great Lakes, say as far as Ohio, and south, say as far as Maryland or Virginia. Another focus, beginning with Minnesota, has stretched east toward Ohio and also somewhat west. A third focus might be conceived as originating in Mississippi or Alabama and stretching north along the coast to Virginia or Maryland. We lack as yet any data of consequence to support this view. We know, however, that poliomyelitis appeared in epidemic form in Minnesota about the time it appeared in New York City and its vicinity and that these two foci were not connected with each other so far as can be determined. It will be noted in Table 3 that the crest of the prevalence of this disease in Alabama and Mississippi distinctly antedates that of States farther north, like Virginia and Maryland. We have no reports from Georgia and North Carolina, but we know that the disease prevails in these States. The prevalence of the disease in the inland States, like Kentucky and Tennessee, is distinctly lower than in those along the coast, with the exception of Florida. As stated, these comments are largely conjectural, but if the groups of States mentioned above are marked out on a map, their arrangement will be found to be quite striking, whatever its meaning may be. It has been suggested that in this connection main lines of travel might receive consideration.

PUBLIC HEALTH ADMINISTRATION.

CITY OF BIRMINGHAM AND COUNTY OF JEFFERSON, ALABAMA.

By Carroll Fox, Surgeon, United States Public Health Service.

The following report gives the results of a study of health administration and organization in the city of Birmingham and the county of Jefferson. This study was carried on throughout a period of approximately three weeks.

The desirability of unifying the public-health systems of the city of Birmingham and the rest of the county of Jefferson soon became apparent, and the study was therefore made with that object in view.

Jefferson County has an area of 1,059 square miles and a population estimated at 103,999, of which 61,774 are white and 42,225 colored.

There are seven municipalities in the county. The largest, exclusive of Birmingham, is Bessemer, with an estimated population of 13,860. The smallest municipality has a population of but 350.

The principal industries of the county are mining, the manufacture of steel and iron and their products, and agricultural pursuits.

The city of Birmingham covers an area of 50 square miles, and has a population estimated at 174,108, of which 105,459 are white and 68,649 colored.

The principal industries of the city of Birmingham are the manufacture of steel and iron and their products.

For information and assistance received in the preparation of this report the writer is indebted to the officials of the city and the county health departments, to other officials, and to various other citizens interested in the public health.

COUNTY OF JEFFERSON.

The county medical society is, under the law, the county board of health, as well as the board of health for the municipalities within the county boundaries.

The board of censors of the county medical society acts as the board of health ad interim.

This board of health appoints both county and city health officers. The law provides for both full-time and part-time county health officers, and specifies that the county health officer may also act as city health officer.

In the case of the full-time county health officer, the law specifies the salary that shall be paid. The amount of this salary is based upon the population.

In Jefferson County the health officer was appointed as a part-time official, but at present is practically a full-time health officer. He receives $3,000 per annum and is provided with a clerk and three sanitary inspectors.

Powers and duties of the full-time county health officer.—To visit as far as practical all cases of communicable diseases for the purposes of enforcing measures to prevent the spread; to make especial efforts to locate all cases of tuberculosis and pellagra for the purpose of urging prompt treatment or to give instructions to prevent the spread of the disease; to inspect the schools and school children of the county at least once annually; to educate the people and the dealers in food products of the importance of protecting food from dust and insects; to disseminate information by lectures, newspaper articles, demonstrations, etc.; to instruct the people how to maintain sanitary conditions, to provide themselves with pure drinking water, pure milk, and sanitary closets; to make the necessary reports; to attend meetings of the court or board of revenue for the purpose of giving such court or board information as affects the public-health interests of the county; and to discharge such other duties as may be required by law.

Discussion.—During the course of the study the following places were visited: The municipalities of Bessemer and Leeds; Maxine, a mining camp; several camps operated by the Tennessee Coal, Iron & Railroad Co.; and two penal camps. During these visits the opportunity was taken to look superficially into rural conditions.

With the exception of the camps operated by the Tennessee Coal, Iron & Railroad Co., it must be said that conditions were found to be bad and preventable diseases prevalent, including typhoid fever, malaria, hookworm, pellagra, and tuberculosis.

According to figures received from the office of the county health officer, there occurred in the county of Jefferson, exclusive of the city of Birmingham, during the 12 months period ended June 30, 1916, 1,018 deaths. There was, therefore, a crude death rate of 9.78 per 1,000. Among the white population there were 412 deaths, giving a death rate of 6.5 per 1,000, and among the colored population there were 616 deaths, giving a death rate of 14.58 per 1,000.

It can be assumed that these low rates do not indicate the true conditions, and it must, therefore, be concluded that the deaths occurring in the county are not all reported.

During the same period there was reported a total of 2,077 births, of which 1,453 occurred among the white population and 624 among the colored population, making a total birth rate of 19.97—a white birth rate of 23.52 and a colored birth rate of 14.77 per 1,000.

The number of cases of and the deaths from certain of the communicable diseases reported during the same period were as follows:

	Cases.	Deaths.		Cases.	Deaths.
Pulmonary tuberculosis	43	143	Smallpox	5	0
Typhoid fever	157	34	Diphtheria	21	7
Malaria	39	9	Scarlet fever	25	3
Pellagra	47	34			

The county of Jefferson offers magnificent opportunities to carry on intensive work along the line of preventive medicine, which should be productive of great benefit to the communities concerned. Communicable diseases existing in the county may be readily introduced into the cities, and vice versa, and it would seem futile to perform the preventive work unless it was carried on in the county and the cities simultaneously. For this reason the suggestion that the health departments of the cities and the county be combined and placed under one controlling head would seem highly desirable.

Such an organization should, in fact, be considered ideal. The arrangement would contemplate a full-time executive officer, occupying the dual position of health officer for the county and the municipalities included within its boundaries. He should have under him two assistants, each in charge of a subdepartment, one the health department of the city of Birmingham and the other the health department of the county and other municipalities.

The two assistants appointed to aid the executive officer should be relieved of all executive or administrative work, and should be required to assume charge of the field operations of the subdepartments. They would be essentially epidemiologists of their respective departments, and would also render the professional services at the child welfare, antituberculosis, or other public-health dispensary operated by the health department.

The amount required to maintain a health department for the county capable of performing the work required to place it in a sanitary condition and to eradicate disease among the people would be $30,870.

The assessed valuation of the properly in the county amounts to $147,000,000. On this there is levied a tax of 7 mills, which produces an income of $1,029,000; $30,870 represents 3 per cent of this amount, and is little enough to spend in the interest of the public health.

It should be expended about as follows:

1 county health officer and health officer for the cities, not less than	$3, 500
1 assistant health officer for county, not less than	2, 500
1 sanitary engineer, not less than	2, 000
1 clerk and registrar	1, 200
5 public-health nurses, at $75 per month	4, 500
5 sanitary inspectors, at $80 per month	4, 800
1 bacteriologist	2, 100
1 laboratory assistant	840
	21, 440
Transportation, lanterns and slides, office and laboratory supplies, printing, etc	9, 430
	30, 870

The city of Bessemer receives an income for general expenditures of approximately $100,000. Five per cent of this amount, or $5,000, should be set aside for the employment of a force of workers in and around the city of Bessemer and to supplement the force employed by the county.

This sum would be sufficient to employ a man trained in sanitary science as assistant health officer, one sanitary inspector, and two public-health nurses.

Upon the completion of an organization as contemplated above the county should be divided into five districts, exclusive of the cities of Birmingham and Bessemer, in each of which there should be placed a public-health nurse and a sanitary inspector, with facilities for transportation. An office should then be opened and a portable laboratory established at a convenient point in each of these districts consecutively and an intensive survey carried on, together with an energetic campaign of education.

ADMINISTRATION AND ORGANIZATION IN THE CITY OF BIRMINGHAM.

In accordance with the statute the board of health has appointed a health officer for the city of Birmingham. He is a part-time official and receives at present a salary of $600 per annum. This health officer also acts as city physician, receiving an additional salary of $75 per month for his services in that capacity.

In all questions involving health and sanitation the health officer acts under the direction of the county board of health and the board of city commissioners.

Powers and duties of health officer of city of Birmingham.—To keep a record of births, deaths, and reportable diseases; to exercise general supervision over the public health of his community; to investigate cases of communicable diseases and report results to the board of commissioners, the committee of public health of the county board of health, and to the State health officer; to keep on hand a supply of vaccine virus and to vaccinate all indigent persons applying for vaccination; to inspect the municipality once each month as well as the municipal prisons, charitable institutions, etc., within the city once each month relative to ventilation, sewage disposal, etc.; to make reports required by law; to attend conferences of health officers when summoned by the State health officer; and to perform such other duties as may be required.

Personnel.—The following is a list of the employees of the city health department, together with their annual salaries:

1 health officer	$600
1 registrar of vital statistics	960
1 clerk	840
1 chief sanitary inspector	1,800
7 sanitary inspectors, at $960	6,720
1 communicable-disease nurse	900
1 chief meat and milk inspector and bacteriologist	2,100
I assistant milk inspector	1,140
1 assistant meat inspector	1,140
1 assistant meat inspector	960
2 food inspectors, at $900	1,800
1 physician to pesthouse (part time)	600
	19,560

In addition to the above there is one communicable-disease nurse loaned and paid for by the children's hospital for emergency work in connection with typhoid fever.

There is also one infant-welfare nurse, employed by private philanthrophy, who works under the supervision of the health department, and there are loaned for emergency purposes by the police department eight patrolmen, who act as sanitary inspectors.

Sanitary inspectors.—There are seven sanitary inspectors, who work under the supervision of a chief inspector. They are required to perform, in addition to sanitary work, certain epidemiological duties which should devolve upon a corps of employees having greater technical knowledge. As in many other cities, much of their time is given over to the investigation of complaints, many of which have little bearing upon the public health.

There are six matters which have an important bearing on the public health and to which sanitary inspectors should give special attention. If their entire time were taken up in this way they would be doing extremely important work.

These things are as follows: The abolition of surface privies, the elimination of the surface well, the proper disposal of manure, the proper garbage receptacle, the elimination of stagnant water breeding mosquitoes, and the regulation of housing conditions. The proper regulation of all these matters would go far to insure a healthy city.

Transportation.—The health department maintains three automobiles—one for the use of the chief sanitary inspector, one for the use of the chief meat and milk inspector, and one for the dairy inspector.

In addition to these the sanitary inspectors are furnished with two motorcycles and three bicycles.

The inspectors of the health department receive free transportation on the street railway.

Office hours of department.—The health department is open from 8 a. m. to 5 p. m. daily. The Sunday hours are from 9.30 a. m. to 10.30 a. m. One hour is allowed each employee for lunch. On Saturday the office closes at 12 o'clock, except for two employees, who remain to perform emergency work. Ten days' vacation is allowed each employee annually with pay.

REGISTRATION OF BIRTHS AND DEATHS.

The registration of births and deaths is provided for by statute. The city of Birmingham is in the registration area for cities. The law does not provide for reimbursement for certificates of births and deaths registered by local registrars.

Registration of deaths.—In computing the following statistical information figures for the 12-month period ended June 30, 1916, were used. During this time there were recorded in the health department 2,528 deaths (exclusive of stillbirths), which, in a population of 174,108, gave a crude death rate per 1,000 of 14.5. The death rate among the white population was 10.6, while the colored death rate was 20.4 per 1,000. There were reported during this period 295 stillbirths.

Preventable diseases.—There were reported to the health department during the same period 1,507 deaths from causes that might be classed as preventable, or 59.6 per cent of the total deaths recorded.

These causes are given more in detail in the following table, which also shows the death rate per 100,000 and other pertinent information:

Disease.	Number of cases reported.	Number of deaths (all ages).	Death rate per 100,000.	Case fatality rate per 100.	Number of deaths in children under 1 year.
				Per cent.	
Tuberculosis, pulmonary	514	294	168.8	57.2	3
Tuberculosis, other forms		60	34.4		5
Typhoid fever	528	58	33.2	10.9	0
Diphtheria	137	14	8.0	10.2	2
Smallpox	3	0			0
Whooping cough	48	8	4.3		2
Measles	95	1			0
Scarlet fever	110	2			0
Pellagra	79	86	49.3		0
Malaria		16	9.1		0
Influenza		41	23.5		2
Tetanus		6	3.4		2
Dysentery		7			1
Septicemia (including puerpera)		25			0
Syphilis		55			14
Gonorrhea		1			0
Pneumonia		216	124.0		34
Diarrhea and enteritis		120	68.9		68
Cerebrospinal meningitis		8	4.5		0
Bronchitis		20			5
Malignant growths		91	52.2		1
Accidental deaths		190			8
Premature births		87			87
Congenital debility		36			36
Other causes peculiar to early infancy		65			65
Total		1,507			335

Infant mortality.—The infant mortality rate in the city during the 12 months' period ended June 30, 1916, was 107 per 1,000 births, there having been 335 deaths in infants under 1 year of age. For practical purposes all of these deaths can be considered preventable. The infant mortality rate among the white population was 81.1, while among the negroes it was 166.6. The above table gives the causes of death under 1 year in detail.

Registration of births.—There were registered with the health department during the 12 months' period ended June 30, 1916, 3,128 births, giving a birth rate of 17 per 1,000. The number of births among the white population was 2,144, making a birth rate of 20.3, while among the colored population there were 984 births reported, giving a birth rate of 14.3 per 1,000.

EPIDEMIOLOGICAL ACTIVITIES.

The Report of Diseases.

Requirements of law.—In accordance with State law the following diseases must be reported promptly by physicians to the health officer. Heads of families are also required to report such diseases when no physician is in attendance.

Actinomycosis.
Anthrax.
Beriberi.
Chicken-pox.
Cholera (Asiatic).
Diphtheria (membranous croup).
German measles (Rœtheln).
Glanders.
Hydrophobia.
Leprosy.
Malaria.
Measles.
Meningitis (epidemic cerebrospinal).
Mumps.
Ophthalmia neonatorum (conjunctivitis of new-born children).
Pellagra.
Plague.
Poliomyelitis (infantile paralysis).
Scarlet fever.
Smallpox.
Tetanus.
Trachoma.
Tichinosis.
Tuberculosis (pulmonary).
Typhoid fever.
Typhus fever.
Whooping cough.
Yellow fever.

Persons suffering with a communicable disease must not be removed or brought into the city.

Wherever quarantine has been established at any room, apartment, or premises it is unlawful for any person under 15 years of age to leave the same without a permit from the health officer.

Wherever any case of communicable disease is being treated in any room or apartment that exposes the people of the immediate vicinity to the danger of contracting the disease, the health officer may remove the case to another room or apartment where the danger of communication is less likely to occur.

The quarantining of bacillus carriers is authorized.

The use of the common towel and the common drinking cup is prohibited in any hotel or passenger railway station in the city of Birmingham.

Whenever smallpox is declared by the commission likely to become epidemic it is the duty of all citizens to cause themselves to be vaccinated until the operation proves effective, and to have all children under their care vaccinated. A certificate of immunity may be accepted in lieu of vaccination.

Whenever the health officer believes that any person has been exposed to smallpox he is granted authority to order that such person be vaccinated, and it is the duty of said person after such order is received to be vaccinated within 24 hours.

No child is allowed to enter any of the public schools of the city who has not been vaccinated. Each child applying to enter any of the schools must be vaccinated or present a certificate from a reputable physician that he or she has been successfully vaccinated.

Ordinances also provide for the disinfection of apartments after death or removal of a case of tuberculosis and for the removal of a patient to a suitable place, where it is deemed necessary by the health officer to prevent the spread of the disease, and they prohibit the attendance at school of pupils or instructors who are suffering from tuberculosis, etc.

In addition to the above there are other ordinances granting authority to the city commission to establish quarantine if necessary and regulating the holding of public funerals of persons dead of certain of the communicable diseases, etc.

Methods of procedure.—In reporting diseases physicians make use of the telephone in the majority of instances. Blank forms are provided for the purpose of reporting, but, except in the case of tuberculosis, are rarely utilized. In the case of all diseases, except tuberculosis, the information obtained by telephone is entered upon a card devised for that purpose as well as in a register. A separate book is used to register cases of tuberculosis. A monthly report is made to the county health officer of all cases reported to the city health department.

Control of Diseases.

Requirements of law.—The most important ordinances relating to the control of diseases are summarized as follows:

When authorized by the commission to incur the expense, the city health officer is required to take charge of the necessary measures to combat any communicable disease.

The city health officer is authorized under certain restrictions to remove any person not in his own home suffering from a communicable disease to such place as may be provided for the purpose.

It is forbidden to conceal any case of communicable disease.

It is forbidden for any person suffering from any communicable disease to leave the premises without permission. The same restriction applies to the nurse or attendant upon the sick person.

It is the duty of any person owning or occupying premises where a case of communicable disease has been, to thoroughly cleanse and disinfect the same.

Methods of procedure.—The card upon which is entered the report of a disease is also used to note the information obtained after epidemiological investigation. Such investigation is made by the sanitary inspectors, and is more or less complete in the case of typhoid fever. In the case of scarlet fever and diphteria, the information is obtained only as to the source of the milk supply and the history of contact. The methods of handling the common communicable diseases are shown in the table which follows later on.

The sanitary inspectors placard houses and perform the necessary disinfection.

There is no hospital for the isolation of any communicable disease except smallpox.

Typhoid fever.—Typhoid fever is endemic in the city of Birmingham and very recently has assumed the proportions of an epidemic. There were reported during the 12 months' period ended June 30, 1916, 528 cases of typhoid fever and 58 deaths. The death rate during that period was 332 per 100,000 and the case fatality rate was 10.9 per cent.

An annual death rate of 33.2 is not unusual in Birmingham. It is not unlikely, judging from the case-fatality rate, that there are a number of cases of typhoid fever which are not reported to the health department.

The city water supply of Birmingham is excellent. There are, however, a number of conditions existing in the city which account for the continued prevalence of typhoid fever.

The principal of these causes are the insanitary privy and the great number of flies. To this may be added the opportunity of infection through direct contact with cases or carriers.

Tuberculosis.—There were reported to the health department during the 12 months' period ended June 30, 1916, 514 cases of and 294 deaths from pulmonary tuberculosis. There was, therefore, a death rate during that period of 168.8 per 100,000 and a case-fatality rate of 57.2 per cent.

It is obvious that this high death rate calls for some active work on the part of the health department. The high case-fatility rate shows conclusively that there are many cases of tuberculosis not reported.

Antituberculosis activities.—The antituberculosis activities of the city and county are carried on by the county antituberculosis association.

There are employed in the work two nurses, one of whom is colored, and the necessary physciians who give their services free of charge.

A sanatorium with a capacity of 34 beds is maintained. In this sanatorium are taken both advanced and incipient cases. A dispensary operated by the society is open twice a week under the supervision of a physician. Here the necessary professional work required in the diagnosis of tuberculosis is performed.

The nurses are engaged in the usual work connected with such activities, both within the city and to some extent in the county. Sputum cups and napkins are furnished free of charge to patients as well as literature on the subject of the prevention and cure of tuberculosis.

The expenses of the society are defrayed by funds raised through private philanthropy and the sale of Red Cross stamps and by assistance from the county.

There has recently been inaugurated by the society an open-air school for children from tubercular families or children who are anemic, tubercular, or otherwise in need of the advantages offered by such an institution.

It is located in an unimproved city park. For protection against inclement weather there is provided a well-screened pavilion, open on all sides and furnished with roll curtains made of awning material. The toilet is of the pail type protected against the ingress of flies.

One meal a day is provided and milk is furnished three times a day. It is expected to continue this school throughout the winter months.

The tuberculosis sanatorium.—The tuberculosis sanatorium is pleasantly located just without the city limits. The expense of maintenance is borne by the antituberculosis association with some assistance from the county. It comprises a building in which is located the kitchen and mess hall, nurses' quarters, and two pavilions which will accommodate approximately 34 cases. Another pavilion is at present under construction.

Both incipient and advanced cases are taken. The latter are taken because there is no other place to care for them. Chickens and vegetables are raised at the institution. Milk is obtained from outside sources. Water is derived from the city water supply and sewage is disposed of by means of a septic tank.

Smallpox.—During the 12 months' period, ended June 30, 1916, there were but three cases of smallpox reported, all among the colored race.

The usual practice in combating this disease is to isolate the case in the county smallpox hospital and vaccinate all contacts, after which no quarantine is required. If for any reason the case can not be removed, contacts are vaccinated and placed under quarantine.

Smallpox hospital.—The smallpox hospital is owned and maintained by Jefferson County. It is located approximately 4 miles outside of the city limits.

It is built on the pavilion plan. All buildings are constructed of wood. There is a residence which is occupied by the caretaker of the hospital. There are four buildings used for the isolation of patients—two for white and two for colored. A small house is provided at each pavilion for the physician to change his clothing before seeing a case.

Sewage is disposed of by means of the insanitary surface closet. Water is obtained from a surface well and is not piped to the pavilions. Approximately 75 patients may be cared for at the smallpox hospital, and there is plenty of land on which to erect tents if necessary.

Diphtheria.—During the 12 months' period ended June 30, 1916, there were reported to the health department 137 cases of diphtheria and 14 deaths, giving a death rate of 8 per 100,000, and a case-fatality rate of 10.2 per cent. This case-fatality rate is too high if antitoxin is used promptly and in sufficient quantities. The State will furnish antitoxin free of charge to indigent cases.

Swabbings from throats of contacts is not performed as a routine measure, and contacts over 15 years of age may be permitted to carry on their vocation or attend school without having swabbings taken.

Malaria.—During the 12 months' period ended June 30, 1916, there were reported 16 deaths from malaria, making a death rate per

100,000 of 9.1. In this connection it may be said that it is an easy matter to find anopheline mosquitoes breeding within the city limits, as determined by personal observation.

Infant mortality.—During the 12 months' period ended June 30, 1916, there were reported to the health department 335 deaths in infants under 1 year of age, making an infant mortality rate of 107 per 1,000 births. The high infant mortality occurs in the colored race, being 166.6, while the white race showed a rate of 81.1.

Infant welfare activities.—The infant welfare activities are carried on by one nurse, who is paid out of funds raised by private philanthropy, and who works under the supervision of the health department.

The method of procedure is to follow up all births reported from certain districts and to give the necessary instruction by word of mouth and by practice, in the way to care for the infant, including bathing, feedings, and clothing. Information relating to the need of nursing care in specific instances is also received from the various free medical dispensaries in the city.

Some prenatal work is also performed, as well as work of a purely charitable nature. The latter is required because the activities previously carried on by the associated charities have recently been taken over by the city, and the new organization is not yet completed.

Ice and milk are furnished in limited quantities where necessary, as well as drugs and commercial infant foods. The poor are also helped financially in other ways.

Discussion.—In studying the activities of the health department it is necessary to keep in mind two important matters—the work that is directly concerned with the environment and the work that is directly concerned with the individual.

In Birmingham the health department is fairly well equipped to care for the former, but very inadequately provided with means to supervise the health of the individual.

A proper supervision over the case and the carrier is considered, according to modern views, the important side of public health work, and therefore the important unit of the health department from this viewpoint is made up of the epidemiologist, the bacteriologist, and the public-health nurse.

In Birmingham an epidemiologist is not employed at all, and the nursing staff is inadequate in number. If the work of the nurses now employed by various bodies were properly correlated, it would be productive of better results.

It is therefore essential that a full-time physician versed in the science of preventive medicine be appointed in the health department to carry on the epidemiological work in connection with all cases of communicable diseases, but more especially in the cases of typhoid fever, tuberculosis, diphtheria, and scarlet fever, and to furnish the professional services required at infant welfare stations and the antituberculosis dispensary, which should be maintained by the health department in certain sections of the city.

To assist the epidemiologist there should likewise be provided a corps of not less than 10 public-health nurses. The city should then be divided into 10 districts. In each there should be placed a nurse to perform within her district all of the public-health duties required; i. e., prenatal and infant welfare work, communicable disease nursing, including antituberculosis activities, and school nursing.

In order to bring this about it would be wise to combine the present public-health nursing forces of the city by placing them in the health department under the supervision of the epidemiologist. Such nurses should be paid by the health department.

This would make available moneys now collected through private charities to be used for purposes which are strictly charitable and not of a public-health nature.

It would seem advisable for the school authorities to enter into such an arrangement, turning their nurses over to the staff of the health department. They would then have for school work 10 nurses instead of 2, as at present.

It is recognized that to a large extent the common communicable diseases are disseminated through direct contact of a healthy person with one suffering from a communicable disease.

It is therefore essential to eliminate the focus of infection by isolating the patient or carrier in an institution constructed for that purpose. This means the erection of a hospital in the city of Birmingham to care for all cases of communicable diseases except tuberculosis. Such an institution should contain not less than 30 beds.

In the case of tuberculosis the same argument applies, and it is therefore necessary to have an institution where tuberculous patients who are discharging tubercle bacilli could be properly isolated, thus removing a focus of infection which is a menace to the community.

It is therefore desirable that the county of Jefferson erect a tuberculosis sanatorium, for which it already has the legal authority, to care for advanced cases of tuberculosis originating within its boundaries, including the city of Birmingham. Such an institution should contain not less than 100 beds. Proper ordinances should be enacted compelling advanced cases of tuberculosis to go to the sanatorium.

It would then be possible for private philanthropy to expend its funds in the maintenance of the present tuberculosis sanatorium, which could be used for incipient cases only.

Tabulation of the methods used in Birmingham to prevent the spread of communicable diseases.

Disease.	To be reported.	To be placarded.	Isolation of patient.	Quarantine of contacts.	Terminal fumigation.	Sale of dairy products.	Exclusion from school.		Special precautions.	Disinfection and discharges required.
							Patient.	Contacts.		
Diptheria	Yes	Yes	Yes, until 2 consecutive negative cultures have been obtained.	Yes, of all under 15 years if patient adequately isolated.	Yes	Prohibited	Yes	All under 15 years.	Isolation of bacillus carriers required.	None.
Scarlet fever	Yes	Yes	Yes	Same	Yes	Same	Yes	Yes	None	None.
Measles	Yes	Yes	Yes	Yes, except those who have had the disease.	None	Same	Yes	Yes, of nonimmunes only.	None	None.
Smallpox	Yes	Yes, if not taken to isolation hospital.	Yes, in isolation hospital.	Contacts vaccinated but not quarantined.	Yes	Same	Yes	Until after vaccination and observation for 14 days.	Vaccination of all contacts.	None.
Typhoid fever	Yes	No	None	None	None	Same	Yes	No	Disinfection of bedding and clothing required before laundering.	Yes, of feces and urine.
Tuberculosis	Yes	No	None	None	Yes	Same	No	No	Nurses of antituberculosis society visit and instruct patient.	None.
Whooping cough	Yes	No	Patient permitted to leave premises, and required to wear green cross on sleeve.	None	None	Not prohibited.	Yes	No	None	None.
Chicken pox	Yes	Yes	Yes	Yes, of nonimmunes only.	None	Same	Yes	Yes, of nonimmunes only.	None	None.

The Diagnostic Laboratory.

The diagnostic laboratory is located in a large, well lighted, and ventilated room in the city hall. There are employed in the work one bacteriologist, who is also chief meat and milk inspector, and one clerk, who is engaged temporarily on account of the emergency which arose during the recent typhoid epidemic.

The routine work of the laboratory consists of the necessary examinations for the diagnosis of typhoid fever, tuberculosis, malaria, diphtheria, hookworm and other intestinal parasites, and gonorrhea, and for the release of quarantine for diphtheria. Chemical analyses of milk are also made, and some water work is performed.

In order to submit blood specimens to be tested for the Widal reaction, Wright's capsules are furnished to the physicians. For the submission of specimens of sputum a small, wide-mouth bottle, with a cork stopper, is furnished. In the case of diphtheria the specimen outfit consists of a tube of Loeffler's blood serum and a sterile swab. In this connection it may be stated that smears are usually made from the inoculated swabs, with the result that a diagnosis may often be made before the culture has incubated.

With the exception of some of the Loeffler's blood serum, all culture media is manufactured in the laboratory.

The laboratory is equipped to perform all of the work that is ordinarily required, although some of the apparatus is worn out and should be replaced.

Data blanks are required to be furnished by the physicians with each specimen submitted for examination. These blanks are the same for all specimens, and contain spaces for date, name of patient, the disease to be determined, residence of patient, and physician's name. A daily record is kept of all examinations made. The report of the results of these examinations is made by telephone.

Tabulation of examinations made in the diagnostic laboratory, year ended June 30, 1916.

	Positive.	Negative.	Total.
Typhoid fever (Widal reaction)	553	1,590	2,143
Malaria	8	258	266
Tuberculosis	219	827	1,046
Diphtheria	86	890	976
Gonorrhea	29	103	132
Hookworm	1	69	70
Meningitis	1	6	7
Milk (chemical)			1,550
Total	897	3,743	6,190

Discussion.—The desirability of establishing an organization which would care for the public health of both the county and the city has already been pointed out. Provision should be made for a county laboratory which should be made available to the physicians and health officers of the county as well as of the municipalities. This would involve the transfer of the present city laboratory to the county.

There will be needed in the laboratory an attendant who could perform the duties of a nontechnical assistant, such as cleaning glassware, making culture media, reports, etc.

It would then be desirable to enlarge the scope of the laboratory, making it possible to have Wasserman reactions determined.

Distributing stations should be established and located at convenient points in the city and county so that physicians may secure mailing outfits with facility.

MUNICIPAL ENGINEERING ACTIVITIES.

The City Water Supply.

The city water supply is owned by a private corporation, and is derived from two different sources—Five Mile Creek and the Cahaba River.

There are two purification plants at which the water from these sources is treated in practically the same way—namely, by sedimentation, coagulation with alum, filtration, and chlorination.

The smaller plant comprises 2 sedimentation and 1 clear-water basin, and 10 filters, each with a capacity of 500,000 gallons. Here hypochlorite is used as a disinfectant.

The larger plant comprises 2 sedimentations and 1 clear-water basin, and 38 filters, each with a capacity of 500,000 gallons. Here liquid chlorine is used as a disinfectant.

Close check is maintained on the quality of the water by a chemist employed by the company.

The methods pursued in securing a pure-water supply for the city are modern and efficacious, as may be seen from the following results obtained in the laboratory:

During the year 1915 the average count of 280 samples of raw water planted on agar and incubated at 20° C. was 3,358. After final treatment the count was 2.2, meaning an efficiency of 99.94 per cent.

During the same period the average count of 280 samples of raw water planted on agar and incubated at 38° C. was 2,091. After final treatment the count was 3.3, showing an efficiency of 99.84 per cent.

The colon bacillus was not found at all in 280 ten c. c. samples of purified water. These figures are for the North Birmingham plant, which has to deal with raw water somewhat more highly polluted than that of the other supply.

At the Cahaba plant during 1915 the average count of 193 samples of raw water planted on agar and incubated at 20° C. was 1,399. After final treatment the average count was 1, meaning an efficiency of 99.86 per cent.

On agar kept at 37° C. the count for 193 samples averaged 556, and after final treatment 1.4, meaning an efficiency of 99.74 per cent.

The bacillus coli was found but once (October) in 193 ten c. c. samples.

In addition to the check kept on the water at the plants there are frequent examinations made from taps in various parts of the city.

Of 1,106 samples collected in this way the average count on agar at 20° C. was 9.3, while the average count on agar at 38° C. was 7.3.

In 1,106 ten c. c. samples examined during the year 1915 but two showed the presence of colon bacilli—one in the month of June and one in the month of October.

It is estimated that approximately 90 per cent of the inhabitants of the city use city water, the rest deriving their water supply from surface wells and springs. This is a dangerous proceeding in a limestone country, as the chances for pollution are great. Therefore all wells and springs should be eliminated, and it should be compulsory for all persons within the city to supply themselves with city water.

Disposal of Sewage.

Sewers have been made available to about three-fourths of the population of Birmingham.

The sewage is disposed of by means of two plants, where it undergoes septic action and oxidation in contact beds.

The sewers located in the older part of the city are at present too small for the purpose, as they were planned and laid for a much smaller community.

In addition to the sanitary sewers there is also a system of storm-water sewers.

One of the greatest evils to be found in the city is the dry surface closet open to flies. There are approximately 8,000 of these closets in the city, which no doubt accounts to a large extent for the endemic typhoid fever.

It is essential that these surface closets be abolished without delay. Houses should be made to connect to the sewer where such is available. There is already sufficient law to compel sewer connections. Where there is no sewer the installation of a sanitary dry closet should be insisted upon. The necessary ordinance has already been enacted and the attention of the sanitary inspectors, as well as the patrolmen of the police department, should be concentrated on this matter. One inspection is quite enough to determine when the nuisance exists, and written orders to abate the same should be issued immediately. If in the time allotted reinspection shows that the approved type of closet has not been installed, the case should be brought to the attention of the court. This is an emergency measure that should be pushed to the limit.

The city collects night soil, charging the householder 35 cents per month for the service. The fecal matter is dumped into cans which are taken to a central point and the contents emptied into a sewer. The cans are then thoroughly washed.

Collection and Disposal of Garbage and Rubbish.

The collection and disposal of refuse is carried on by the city street department. The city owns its own wagons and horses and collects every day in the congested part of the city and from the residential districts once a week.

A city ordinance requires householders to maintain a properly covered garbage tin in which to place garbage and rubbish other than ashes. A separate receptable must be provided for ashes.

There are four incinerators in the city, each of which is of an old type and capable of disposing of a part only of the refuse collected. In fact, they will not incinerate pure garbage at all without the addition of fuel. Therefore a large part of refuse including garbage is dumped—a proceeding not consistent with good sanitation, especially under the conditions existing in Birmingham. On the other hand, the use of rubbish free from organic matter as a fill in low-lying areas of the city is an excellent procedure, as material otherwise useless thus becomes valuable for reclaiming land and frequently results in the eradication of mosquito-breeding centers.

At present there are being recovered from the refuse certain products of some value as junk, as, for instance, rubber, paper, cans, bottles, etc. While ordinarily this would be a good plan, it becomes more or less objectionable in Birmingham because with this material is mixed a great deal of organic matter in the shape of garbage.

Some statistics relative to garbage and rubbish collection during year 1915.

GARBAGE AND RUBBISH.

Average number of loads daily	222
Weight per load (approximately)	1,500
Double teams used	37
Men employed:	
Paid labor	58
Convicts	42
Foremen employed	11

COLLECTION OF NIGHT SOIL.

Single carts	16
Double teams	1
Men employed	18
Loads for the year, averaging 300 pounds per load	11,923
Number of tons	1,288
Total pay roll for both departments	$42,669.70
In use July, 1916, to collect garbage and rubbish:	
Double teams	26
Single teams	1
Men employed	57
Foremen	6

MILK AND FOOD INSPECTION.

Control of the Milk Supply.

There are at present engaged in this work the bacteriologist of the health department, who is the chief milk inspector, and one assistant to carry on in part the inspection of dairies, together with the inspection of milk depots and the collection of specimens where necessary.

Before any person may engage in the milk business he is required to secure a permit from the health department, which is issued free of charge after an inspection of the premises. There are two permits in use—one for milk-producing establishments and one for stores selling milk.

The ordinances providing for safe milk are adequate except that there is no requirement that milk be pasteurized except when used in the manufacture of ice cream. This ordinance was recently enacted because of the typhoid outbreak. Neither is there an ordinance requiring that all milk be sold in original packages. It is estimated, however, that 75 per cent of the milk sold in the city is delivered in that manner, an ordinance requiring that when so sold it must be bottled at the producing farm or milk depot.

Dairies are scored according to the methods used by the Department of Agriculture. An inspection of a few of these dairies showed that the health department, through educational means, has been making commendable efforts to improve the condition of the dairies, and that the dairymen were sufficiently progressive to profit by the instruction received. Dairy barns were clean, well lighted, and ventilated, and had clean wooden or concrete floors, with provision made for drainage. Cow yards were well drained; the small-top milk pail was in use; milk houses were separate from the barns and screened from flies. All producing farms inspected were provided with the pail system for the disposal of fecal matter. The method of application of this system, however, could be improved in several instances.

Provision was made for sterilizing, mostly by means of small steam boilers. Ice was used in every case and, in the majority of instances, milk cooled immediately and rapidly by an approved form of cooler through which ice water circulated.

Bottling and capping were done by hand in every instance. The character of the dairies makes it possible to produce a fairly clean milk provided the principles of cleanliness are applied.

Heretofore the tuberculin test has been applied to all the milch cattle, but because of the policy of retrenchment necessitated on the part of the city government, due to a lack of funds, the services of some necessary employees were discontinued, and the tuberculin test was therefore abandoned for the time being at least.

No bacterial counts of the market milk of Birmingham have been made in the laboratory for some time. The reason for this is the lack of the necessary assistance in the laboratory to perform the various duties required.

Discussion.—A majority of the producing farms supplying milk to the city of Birmingham (approximately 145 in number) are located within a radius of 7 miles of the city limits. With proper facilities for transportation it would be possible for one dairy inspector to visit each of these dairies sufficiently often within a yearly period to keep a fairly good check on the methods used. This, however, would be impossible if the same inspector were required to perform city milk work in addition to dairy inspection.

There is badly needed another employee in the milk division to act as city milk inspector for the inspection of milk depots and wagons and the collection of samples of milk delivered to the customers, and to have supervision over the pasteurizing plants in the city.

It would then be advisable to resume the bacteriological examinations of the milk furnished to the city in order to determine by bacterial count the quality of the milk sold. When this can be done in a systematized way it would likewise be advisable to publish the results of the examinations in the daily papers. Milk showing more than 500,000 bacteria per cubic centimeter should not be permitted to be sold, even after pasteurization.

Because of the personal element which enters into the production of milk, and of the great danger of introducing infection through the hands of the milker, flies, or the animals from which the milk is obtained, it would seem advisable to require that all milk used in the city of Birmingham be pasteurized by the holding method, such milk to be held at a temperature of 145° for not less than 25 minutes, the pasteurizing machine to be provided with a temperature recorder and a thermoregulator. This does not mean that the efforts to maintain cleanliness on the producing farm should be relaxed, but merely offers an additional precaution that will effectually nullify the evil effects of any accidental infection that may be introduced into the milk.

Tabulation of information relative to the milk supply of the city of Birmingham.

Number of dairies supplying milk to the city		180
Longest haul	miles	240
Shortest haul	do	.2
Number of dairies located within a radius of 7 miles of city		145
Daily consumption of milk	gallons	9,443
Daily consumption of buttermilk	do	3,229
Daily consumption of cream	do	380
Number of chemical analyses made in laboratory		1,550
Number of times dairies scored		1,045
Number of dairies scored		151

Class.	Number.	Percentage.
50 to 60	3	1.93
60 to 70	16	10.63
70 to 80	107	70.87
80 to 90	20	13.25
Above 90	5	3.32
	151	100.00

Inspection of Meat and Other Food.

Meat inspection.—There are two men engaged in the inspection of meat, one of whom is a veterinarian, who makes the necessary ante and post mortem inspections of animals killed in the two local slaughterhouses. The other inspector passes upon imported meats from animals that have been killed under Federal supervision in slaughterhouses located elsewhere.

A number of animals are slaughtered—a few at a time—by farmers and others outside of the city limits and the carcasses brought into the city for sale. This meat must be inspected. It would be wise to arrange by ordinance to prohibit this procedure and to require that all such animals be slaughtered at one of the regular slaughterhouses, so that they can be given a thorough ante and post mortem inspection. An adequate inspection is not feasible under the present arrangement.

Other foods.—There are two inspectors engaged in the inspection of foods other than meat and milk, and in the inspection of restaurants, bakeries, confectioneries, or other place where food is manufactured or sold. Adequate ordinances to cover the subject have been enacted.

This class of work is comparatively new in the city of Birmingham, but has already produced some excellent results in improving sanitary conditions. All such places are scored, similar cards being used in each instance. This seems to be a simple and satisfactory procedure. The scores are published monthly.

HEALTH SUPERVISION OF SCHOOLS.

The health supervision of schools is carried on by the board of education.

There are engaged in the work one physician, who receives $1,500 a year for his services, and others who are employed temporarily at the beginning of the school year to make the necessary examinations.

In addition there are also employed two nurses, who work during the school term. One of these nurses is colored and works in the colored schools.

At the beginning of the school year an intensive inspection is held of all school children who are enrolled. This has for its purpose primarily the detection of communicable diseases, including such conditions as diphtheria, scabies, pediculosis, etc. During this inspection swabbings are taken from the throats and noses of all children who show evidence of having any inflammatory reaction or discharge from the nose or throat. Following this inspection, the work is more especially concerned with detecting those physical defects that are known to retard the advancement of the child during its school life. Attention is also given to the condition of the environment.

The school nurses are engaged in work similar to that of school nurses elsewhere—following up children who have been found defective in the school, by visits to the homes, in an effort to induce the parents to have the defect corrected, at the same time acting as educators to improve sanitary conditions in and about the homes.

EXPENDITURES AND APPROPRIATIONS.

There was expended during the year 1915 the sum of $28,005.22.

There has been appropriated to the health department for the year 1916 the sum of $20,250.

The income of the city from all sources during the year 1915 was $1,838,392, of which $943,423 was obtained through general taxation.

The amount which is available to the city government to defray its ordinary maintenance expenses for the year 1916 is $919,398. This sum represents the total income minus certain funds which are required to pay the interest on bonds, etc.

Computing the amount that should be appropriated to the health department on a basis of 5 per cent of the total available revenues, there should be allowed for public-health purposes the sum of $45,000, as against $20,250, the amount actually received by the health department to carry on its work during the year 1916. This latter figure represents but 2.2 per cent of the total available revenues.

As a comparison it may be stated that there has been appropriated for the year 1916 to the fire department $192,180, or 20.9 per cent; to the police department, $141,210, or 15.3 per cent; to public schools, $248,000, or 26.9 per cent. In addition to the latter amount appropriated to the public schools, there is also received $242,760 from the State and county and $50,000 from fees charged to pupils. Thus, there is a total of $541,000 available for public-school purposes.

In asking for an increase in appropriation for the health department it need not be inferred that an increase in the tax levy is necessarily required. All that is suggested is a more equal and equitable distribution of revenues at the time they are apportioned to the various departments.

In addition to the sum of $45,000 for public-health purposes, there should be allowed for the collection of garbage and rubbish not less than 10 per cent of the city's revenues, which in the case of Birmingham would approximate $91,939. This amount should be sufficient to enable the city to collect and dispose of all garbage and other refuse in an efficient manner.

RECOMMENDATIONS.

As a result of the foregoing study, and after careful consideration of conditions, certain definite conclusions have been reached which have been made the basis for the following recommendations:

1. That a full-time physician skilled in the science of preventive medicine be appointed in the dual capacity of health officer for the county and for the municipalities within the county; that he hold office during efficiency, and that he receive a salary of not less than $3,500 per annum, to be paid by the county; that he be required to perform all of the executive and administrative work, and such field work as may be necessary to supervise the operations of his department.

2. That the health organization over which the above-named official shall preside be divided into two subdepartments—the department of health for the city of Birmingham and the department of health for the county of Jefferson, including all other municipalities.

3. That there be appointed a full-time assistant physician skilled in the science of preventive medicine, who shall be located in the city of Birmingham, and who shall hold office during efficiency and receive a salary of not less than $2,500 per annum, to be paid by the city of Birmingham, and that his duties be concerned with the field activities being carried on by the health department of the city.

4. That there be appointed a full-time assistant physician, skilled in the science of preventive medicine, who shall be located in the county of Jefferson and who shall hold office during efficiency and receive a salary of not less than $2,500 per annum, to be paid by the county. That his duties be concerned with the field activities being carried on by the health department of the county.

5. That there be appointed as an assistant to the county and municipal health officer, for work both in the county and the cities, a full-time sanitary engineer, who shall receive a salary of not less than $2,000 per annum, to be paid from county funds, and who shall hold office during efficiency.

6. That there be installed and maintained by the county a well-equipped laboratory by transfer of the present city laboratory to the county health organization, and that the facilities of this laboratory be made available to the physicians and health officers of the entire county.

7. That there be employed for work in the laboratory a full-time bacteriologist at $2,100 per annum. This figure is mentioned because it is the salary of the present bacteriologist, who has occupied the position for 10 years.

8. That the laboratory staff be increased by the addition of one laboratory attendant at a salary of $840 per annum.

9. That the city of Bessemer set aside $5,000 to defray the expenses of a health organization, to include a full-time assistant health officer trained in sanitary science, a sanitary inspector, and two public-health nurses.

10. That the county of Jefferson, exclusive of the cities of Birmingham and Bessemer, be divided into five districts; that in each there be placed a public-health nurse and a sanitary inspector; that each nurse receive not less than $75 per month and each inspector not less than $80 per month, together with the necessary traveling expenses; that the salaries and expenses of this force be paid by the county.

That adequate transportation be furnished to the field employees of the county in the shape of inexpensive two-passenger automobiles or motorcycles, thus making it possible to cover the territory adequately, economically, and effectively.

11. That as soon as the organization in the county is completed, a sanitary station to include a portable laboratory be opened in each district consecutively from which to carry on intensive work looking toward the eradication of malaria, typhoid fever, hookworm, pellagra, tuberculosis, etc., and that at the same time an energetic educational campaign be entered into including lectures with lantern slides, demonstrations, etc.

12. That pupils of public and private schools in the county and the municipalities be required to be successfully vaccinated against smallpox before admission.

13. That not less than $30,870 be appropriated by the county for the support of the county health department, to be expended approximately as follows:

1 county health officer and health officer for the cities, not less than	$3, 500
1 assistant health officer for county, not less than	2, 500
1 sanitary engineer, not less than	2, 000
1 clerk and registrar	1, 200
5 public health nurses at $75 per month	4, 500
5 sanitary inspectors at $80 per month	4, 800
1 bacteriologist	2, 100
1 laborartory attendant	840
	21, 440
Transportation, lanterns and slides, office and laboratory supplies, printing, etc.	9, 430
	30, 870

14. That the salaries for the new positions mentioned herein be considered as minimum salaries and increased from time to time, in the judgment of the board of health, after the official concerned has demonstrated his efficiency.

15. That for purposes of administration the health department of the city of Birmingham be divided into four parts—a division of epidemiology, a division of sanitation, a division of milk and food inspection, and a division of vital statistics.

16. That the assistant health officer located in the city of Birmingham be placed in immediate control of the division of epidemiology.

17. That the activities of the division of epidemiology be made to include all epidemiological work and all work in which the public health nurses are engaged, namely, the activities concerned with communicable-disease nursing, child welfare, and prenatal work, and school nursing.

18. That at least one infant welfare station and one antituberculosis dispensary be operated by the health department.

19. That the assistant health officer of the city of Birmingham be required to render the necessary professional services at the child-welfare station and antituberculosis dispensary.

20. That the nursing force of the health department of the city of Birmingham be increased to 10 nurses, whose duties shall be those concerned with prenatal and child-welfare work, communicable-disease nursing, including antituberculosis activities, and school nursing.

That all public health nursing of this nature now carried on by other bodies be discontinued.

21. That the city be divided into 10 districts, and that in each district there be placed a public-health nurse to perform within that district all of the duties required of such an official.

22. That the work of the milk and food division be made to include all of the work required in the control of the food supply, including the inspection of dairies, milk, meats, and other foods, restaurants, bakeries, etc.

23. That a chief of the division of milk and foods be appointed at a salary of not less than $1,500 to hold office during efficiency.

24. That in order to more adequately control the milk supply of the city of Birmingham, an additional milk inspector be employed.

25. That all milk supplied to the city of Birmingham be pasteurized.

26. That all meats used in Birmingham be obtained from animals slaughtered at a central point located within the city, or from animals slaughtered under United States Government supervision.

27. That all physicians of the city and county cooperate with the health department in promptly reporting the notifiable diseases under their care, as well as births and deaths.

28. That sewers be extended to all parts of the city, and that householders on a sewer line be compelled to connect without delay.

29. That all insanitary privies be abolished, and where no sewer is available that a sanitary closet be installed.

30. That the work of the sanitary inspectors be especially directed against the abolition of the insanitary closet, the elimination of surface wells, the prevention of fly breeding through the proper disposal of manure, and the requirement that all householders be provided with proper garbage tins.

31. That a survey be made of the mosquito-breeding centers of the city, and that where filling or draining is not possible an emergency oiling squad be employed during the mosquito-breeding season and placed under the charge of a sanitary inspector.

32. That adequate housing ordinances be adopted in order that the overcrowded conditions so common in many cities may be avoided.

33. That the present police force of the city be required to cooperate with the sanitary inspectors of the health department in noting and remedying insanitary conditions, and that until the insanitary privy has been abolished the present arrangement whereby six policemen are detailed for work in the health department be continued.

34. That weekly public-health articles of an educational nature be published by the health department in the newspapers of the city, and that these articles be issued in printed form and used as the weekly lesson in the public schools, a copy of the lesson to be given each child to take home.

35. That all of the ordinances relating to public health be gathered together and published in pamphlet form for the use of the employees of the department and others concerned.

36. That rules governing the operations of the health department be published for the information of the employees carrying out such operations.

37. That the ordinances relative to refuse be amended so that garbage alone will be kept in one receptacle, made of metal, watertight, and with a tight-fitting lid, and that another receptacle be provided for rubbish, including ashes, paper, bottles, cans, etc.

38. That the number of wagons used in the collection of refuse be increased so that it will be possible in addition to the daily collection in the congested district to make a collection of garbage in the residential sections at least twice a week.

39. That the type of refuse wagon be such that it may be used for rubbish and garbage alternately.

40. That all garbage be incinerated.

41. That rubbish be used for filling in low-lying, mosquito-breeding areas.

42. That an amount not less than $45,000 be appropriated by the city commission annually to defray the expenses of the health department, this sum to be spent approximately as follows:

1 assistant health officer	$2,500
1 registrar of vital statistics	960
1 clerk	840
1 chief sanitary inspector	1,800
7 assistant sanitary inspectors, at $960	6,720
1 chief of milk and food division	1,500
1 assistant milk inspector	1,140
1 assistant milk inspector	960
1 meat inspector	1,140
1 meat inspector	960
2 food inspectors, at $900	1,800
10 public-health nurses, at $900	9,000
	29,320
Printing transportation, emergency services, supplies, maintenance, of dispensaries, etc	15,680
	45,000

43. That health officers not be required to perform the work of city or county physician or police surgeon.

44. That the accounts be kept so that the executive officer can determine without delay the cost of operating his department at any time, or the cost of any activity being carried on by his department.

45. That all officials employed in the health department after its reorganization receive at first a probationary appointment only, in order to determine personality and qualifications for public-health work before giving them a permanent position.

46. That the city of Birmingham construct a hospital in which to isolate persons suffering with communicable diseases, with the exception of tuberculosis, such hospital to contain not less than 30 beds.

47. That the county of Jefferson construct, as soon as possible, a sanatorium in which to isolate open cases of tuberculosis. Such hospital to contain not less than 100 beds.

48. That the necessary laws be enacted authorizing the health officer to isolate cases of communicable diseases in hospital when in his opinion it is advisable.

THE LABORATORY DIAGNOSIS OF DIPHTHERIA.

By Newton E. Wayson, Assistant Surgeon, United States Public Health Service.

During the winter months of 1915–16, two diphtheria epidemics, one in West Virginia and one in a reformatory school for boys, in Washington, D. C., together with the consequent school surveys, afforded material for tests of current practice and belief with reference to diphtheria diagnosis.

Three points were studied in some detail, namely:

1. The relation between morphology and virulence for guinea pigs.
2. The relative value of pure and mixed cultures for virulence tests on guinea pigs.
3. The effect on morphologic diagnosis of 2 hours' interval, at room temperature, between making and incubating the culture, as contrasted with that of immediate incubation.

The Relation Between Morphology and Virulence for Guinea Pigs.

The relation between morphology and virulence for guinea pigs resolves itself practically into the question of the virulence of the solid-staining types of organism. The avirulent granular types occur relatively seldom in the throat and nose, even in convalescents from infection with virulent granular types.

The literature reveals a difference of opinion, based on the tinctorial classification of Wesbrook, among laboratory diagnosticians